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Coltricia australica sp. nov. (*Hymenochaetales, Basidiomycota*) from Australia

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Abstract — *Coltricia australica* sp. nov. is described and illustrated from Tasmania, Australia. It is characterized by its annual and centrally stipitate basidiocarps with concentrically zonate and glabrous pilei when dry, angular pores of 3–4 per mm, and ellipsoid, thin- to thick-walled, smooth, pale yellowish, and cyanophilous basidiospores. This species is terrestrial in angiosperm forests.

Key words — *Hymenochaetaceae,* polypore, taxonomy

Introduction

Coltricia Gray, typified by *C. connata* Gray [= *C. perennis* (L.) Murrill], is a cosmopolitan genus of *Hymenochaetales* and has been well studied in Africa (Ryvarden & Johansen 1980), Asia (Núñez & Ryvarden 2000, Dai & Cui 2005, Dai et al. 2010, Dai 2010, 2012, Dai & Li 2012, Baltazar & Silveira 2012), Europe (Ryvarden & Gilbertson 1993), Neotropics (Ryvarden 2004, Baltazar et al. 2010), and North America (Gilbertson & Ryvarden 1986). *Coltricia* differs from other genera in *Hymenochaetales* by the combination of annual stipitate and fragile (when dry) basidiocarps, a monomitic hyphal system, and colored slightly to distinctly thick-walled smooth basidiospores (Dai 2010).

Coltriciella Murrill, the most morphologically similar genus to *Coltricia,* differs by its ornamented basidiospores (Dai 2010). Recent molecular data confirmed that the two genera are closely related in a strongly supported clade, but the monophyly of both genera remains unresolved (Wagner & Fischer 2002, Larsson et al. 2006).

Most species of *Coltricia* and *Coltriciella* are terrestrial or associate with strongly decayed wood. Despite the woody fruitbody texture and phylogenetic

placement within the *Hymenochaetales* comprising mostly white-rot agents of wood, several species of the two genera have been reported to be ectomycorrhizal (EcM) symbionts of different trees based on both morphological and molecular evidence (Thoen & Ba 1989, Tedersoo et al. 2007, 2010).

The stipitate and terrestrial species of *Phylloporia* Murrill, in particular *P. minutispora* Ipulet & Ryvarden, *P. spathulata* (Hook.) Ryvarden, and *P. veraecrucis* (Berk. ex Sacc.) Ryvarden, are frequently misidentified as *Coltricia* and *Coltriciella* in the field, but *Phylloporia* spp. have smaller basidiospores (<4.5 µm long and <3.5 µm wide, Zhou & Dai 2012). However, a reliable delimitation between *Phylloporia* and *Coltricia* is still unknown; for example, *Coltricia stuckertiana* (Speg.) Rajchenb. & J.E. Wright with typical *Coltricia* characters clusters within the *Phylloporia* clade (Valenzuela et al. 2011).

During a field trip in Australia, a specimen of *Coltricia* was collected and originally labeled as "*C.* cf. *cinnamomea*". Molecular evidence (Tedersoo et al. 2007) and careful microscopic examination revealed it to differ from described species and to represent a new *Coltricia* species. Description and drawings of the microscopic structures of this new species are provided.

Materials & methods

The studied specimen was deposited at the herbaria of University of Tartu (TU) and Beijing Forestry University (BJFC). The microscopic procedure follows Dai (2010). A Nikon Eclipse 80i microscope at magnification up to ×1000 was used to study the sections prepared in IKI (Melzer's reagent), KOH (5% potassium hydroxide) and CB (Cotton Blue) solutions. When presenting the variation in the size of the spores, 5% of measurements were excluded from each end of the range and are given in parentheses. The following abbreviations are used: IKI– = negative in Melzer's reagent, CB+ = cyanophilous, L = mean spore length (arithmetic average of all spores), W = mean spore width (arithmetic average of all spores), Q = variation in the L/W ratios between the specimens and n = number of spores measured from the given number of specimens. Line drawings were made with the aid of a light tube. Special color terms follow Petersen (1996).

Taxonomy

Coltricia australica L.W. Zhou, Tedersoo & Y.C. Dai, **sp. nov.** Figure 1

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Differs from *Coltricia cinnamomea* in its slightly smaller basidiospores and narrower contextual hyphae.

Type: Australia. Tasmania, Southwest Conservation Area, Warra Long-Term Ecological Research site, ground in mixed forest of *Eucalyptus* and *Nothofagus*, 8.VIII.2006 (**holotype**, TU 103694; **isotype**, BJFC; European Nucleotide Archive accession number, AM412243 for nLSU).

Etymology: *australica* (Lat.): refers to the country of Australia.

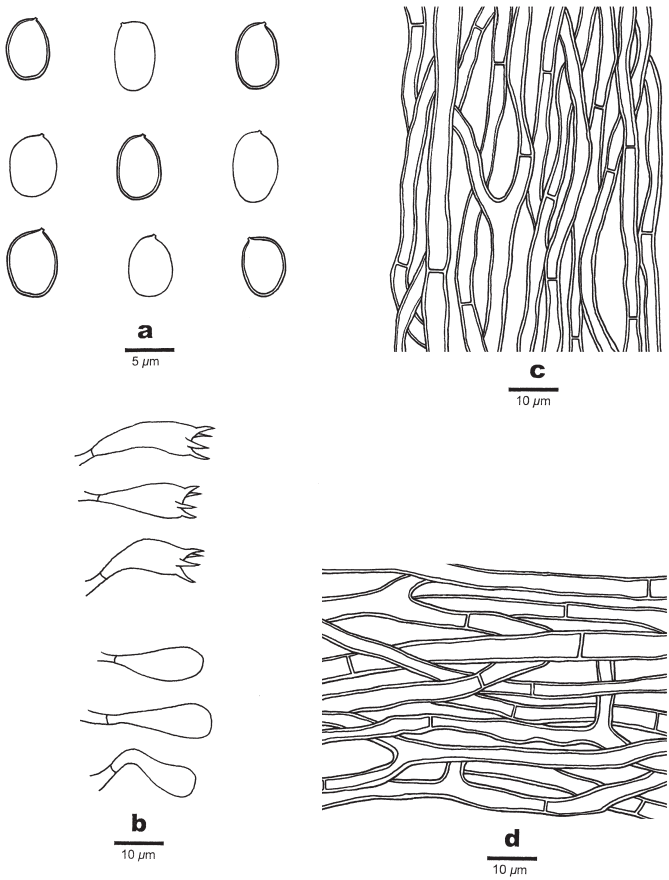

Figure 1. *Coltricia australica* (holotype).
a: Basidiospores. b: Basidia and basidioles. c: Hyphae from trama. d: Hyphae from context.

Basidiocarps annual, centrally stipitate, gregarious. Pileus more or less circular, infundibuliform, up to 3 cm in diam., 3 mm thick at centre. Pileal surface cinnamon to greyish brown, concentrically zonate, when dry with radial wrinkled ridges, glabrous; margin thin, acute, curving down when dry. Pore surface reddish brown to greyish brown; pores angular, 3–4 per mm; dissepiments thin, entire. Context dark brown, coriaceous, up to 1 mm thick. Tubes yellowish brown, paler than the context, fragile when dry, up to 2 mm long. Stipe yellowish brown, matted, up to 3 cm long and 2 mm in diam.

Hyphal system monomitic; generative hyphae simple septate; tissue becoming reddish brown in KOH but otherwise unchanged. Contextual

hyphae pale yellowish to golden brown, thick-walled with a wide lumen, regularly branched and septate, straight, regularly arranged, 3.5–6.5 µm in diam.; hyphae in the stipe similar to those in context. Tramal hyphae pale yellowish to golden brown, thick-walled with a wide lumen, occasionally branched, regularly septate, straight, subparallel along tubes, 2.9–5.5 µm in diam. Basidia clavate, with four sterigmata and a simple septum at the base, 14–21 × 6–7.8 µm; basidioles in shape similar to basidia, but slightly smaller. Basidiospores broadly ellipsoid to ellipsoid, pale yellowish, thin- to thick-walled, smooth, IKI–, CB+, (5.5–)6–7.3(–7.4) × (4–)4.1–5.2(–5.3) µm, L = 6.54 µm, W = 4.77 µm, Q = 1.37 (n = 30/1).

Remarks: The holotype specimen of *C. australica* TU103694 was subjected to sequence analysis of both nuclear large subunit ribosomal DNA (nLSU) and internal transcribed spacer (ITS) regions as described in Tedersoo et al. (2007). The ITS fragment was probably too long to yield a PCR product, but a 1009-nucleotide nLSU sequence was easily obtained. nLSU-based phylograms suggested that this specimen is closely related to a *Coltricia* specimen [MEL (Melbourne Royal Botanical Gardens Herbarium) 2059672, AM412244] also from Australia (Tedersoo et al. 2007) but unavailable for examination. Other *Coltricia* and *Coltriciella* species were phylogenetically well segregated from the two Australian specimens.

Coltricia australica macroscopically resembles *C. cinnamomea* (Jacq.) Murrill, *C. perennis, C. pyrophila* (Wakef.) Ryvarden, *C. subperennis* Y.C. Dai [nom. illegit.], and *C. weii* Y.C. Dai by sharing a central stipe, similar pores (3–4 per mm), and ellipsoid basidiospores (Dai 2010).

Coltricia cinnamomea is distinguished by slightly larger basidiospores (Table 1) and wider contextual hyphae (6–10 µm in diam., Dai 2010).

Coltricia perennis has longer basidiospores (Table 1) and wider contextual hyphae (6–9 µm in diam., Dai 2010) than *C. australica*. In the field, it is easy to differentiate the two species: *C. perennis* grows on gymnosperm forest floors (Gilbertson & Ryvarden 1986, Ryvarden & Gilbertson 1993, Baltazar et al. 2010, Dai 2010), while *C. australica* inhabits angiosperm forests.

Coltricia pyrophila differs from *C. australica* in its smaller basidiospores (Table 1) and loosely interwoven tramal hyphae (Dai 2010).

Coltricia subperennis is distinguished from *C. australica* by its larger basidiospores (Table 1) and narrower tramal hyphae (3–4 µm in diam., Dai 2010).

When dry, *Coltricia weii* has dark reddish to umber pileal surface and umber pore surface (Dai 2010), which are paler than those in *C. australica*. In addition, the basidiospores are weakly cyanophilous in *C. weii* (Dai 2010) but strongly cyanophilous in *C. australica*.

Table 1. Comparison of basidiospore sizes of six similar *Coltricia* species based on Dai (2010) and specimen examined in the present study.

Species	Basidiospores [L × W]
C. australica	6.54 × 4.77 µm, Q = 1.37
C. cinnamomea	7.18 × 5.25 µm, Q = 1.34–1.39
C. perennis	7.41 × 4.70 µm, Q = 1.49–1.67
C. pyrophila	5.20 × 3.82 µm, Q = 1.36
C. subperennis	8.25 × 5.70 µm, Q = 1.42–1.47
C. weii	6.36 × 4.98 µm, Q = 1.22–1.35

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